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APPLICATION OF GOOGLE SHEETS AND MICROSOFT EXCEL INTEGRATION FOR LEARNING EVALUATION

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Abstract
In this digitalized era, the landscape of learning evaluation has experienced a profound evolution thanks to the integration of technology-driven tools. Among these, Google Sheets and Microsoft Excel stand out as pivotal platforms within educational settings, facilitating the management and in-depth analysis of learning data. This study aimed to explore a prototype integration of Google Sheet and Microsoft Excel in increasing the effectiveness of learning evaluation. The research focused on developing a learning evaluation system that seamlessly integrates these two tools. This approach has demonstrated its efficacy in expediting the analysis of learning evaluation data compared to traditional methods. By harnessing spreadsheet technologies like Google Sheets and Excel, educators have revolutionized how they collect, interpret, and present insights from student learning experiences. Google Sheets excels in its accessibility and capability for real-time collaboration among educators, making it ideal for dynamic classroom environments. On the other hand, Excel offers robust analytical functionalities, enabling educators to delve deeper into data patterns and trends. Together, these tools empower educators to conduct evaluations more efficiently, accurately, and collaboratively than ever before. Moving forward, it is encouraged that educators explore and exploit the full potential of these technologies to enrich their evaluation practices. By doing so, they can foster enhanced learning experiences tailored to the needs and progress of each student. Ultimately, the integration of Google Sheets and Microsoft Excel not only streamlines administrative tasks but also empowers educators to make data-driven decisions that positively impact educational outcomes.
Keywords: Automatization, Learning Evaluation, System Integration.

INTRODUCTION

In the current digital era, learning evaluation has undergone a significant transformation with the adoption of technology-based tools, so it is necessary for educators to be able to adapt quickly and integrate this technology in learning activities [1]. In the context of modern education, effective learning evaluation is key to understanding and improving student performance. However, many educators face challenges in collecting, managing, and analyzing learning data efficiently. The use of traditional tools often limits the ability to perform in-depth and collaborative analysis. Several previous studies regarding applications

that have shown success in the student learning evaluation process include the use of spreadsheets in managing report cards [2], the application of Microsoft Excel formulas to elementary school teachers for analysis of residual and school data [3], and the use of Google forms as a learning evaluation medium [4, 5]. These studies showed how spreadsheets and Microsoft excel can be used not only as calculation tools, but also as a means of creating interactive environments that support learning. Google Sheets and Microsoft Excel are two platforms that are often used in education to manage and analyze learning data. The integration of these two platforms allows educators to take advantage of the advantages of each platform (the ease of collaboration and accessibility of Google Sheets, as well as the powerful data analysis features of Excel). Thus, this research aims to explore a prototype integration of Google Sheet and Microsoft Excel in increasing the effectiveness of learning evaluation, providing deeper insight into student performance, and supporting data-based pedagogical decision making.

METHOD

The research was carried out by exploring the integration system between Google Sheets and Microsoft Excel through creating a system prototype in a learning evaluation case study. Some of the prototype materials needed are inputs for learning evaluation in the form of quiz questions or assignments 1 to 4, mid-term exam questions (UTS), and final semester exams (UAS) where these questions are tested online using the Google Form. The results will be saved in the form of Google Sheet. The results of the exam were weighted in accordance with the provisions of the learning evaluation assessment, which were quiz scores 1 to quiz 4 each with a weight of 5%, UTS scores with a weight of 40%, and UAS scores with a weight of 40%. The developing of this system prototype was used in mathematics education course, namely Numerical Methods with a sample of 10 students from Swadaya Gunung Jati University.

Preparation for Google Sheet and Microsoft Excel Integration

Table 1. Conversion of score number to letter.

Number Score	Value
$90 \leq$ Number Score ≤ 100	A
$80 \leq$ Number Score < 90	AB
$70 \leq$ Number Score < 80	B
$60 \leq$ Number Score < 70	BC
$50 \leq$ Number Score < 60	C
$40 \leq$ Number Score < 50	D
$0 \leq$ Number Score < 40	E

The process of preparation involved organizing Microsoft Excel was made into three sheets. Firstly, a score sheet from Google Sheets, secondly, a complete score sheet consisting of quiz scores 1 to 4, UTS scores, and UAS scores and the thirdly was a score sheet to be printed or reported to the appropriate study program, completed with the total value of the numbers obtained along with the conversion in the form of letter values. This sheet also

calculates total scores and converts numerical grades to letter grades as per university regulations outlined in Table 1.

RESULT

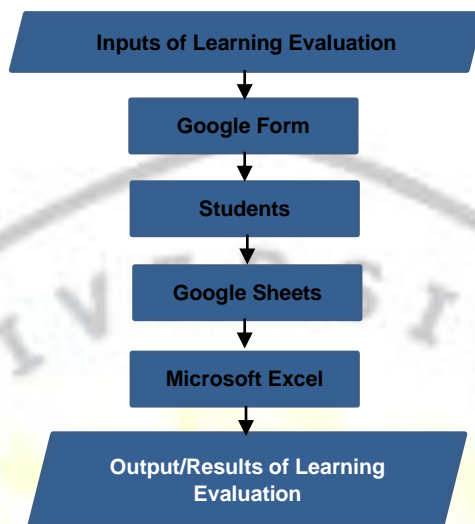### Learning Evaluation Process Flow

Fig. 1. Flow chart of learning evaluation process

This learning evaluation process is carried out online for students by utilizing collaboration between Google Forms, Google Sheets, and Microsoft Excel. It can be seen in Figure 1. Input for learning evaluation was in the form of quiz questions or assignments 1 to 4, mid-term exam questions (UTS), and final semester exams (UAS). These questions are tested online on students using the Google Form platform by first providing students with a link from each Google Form. The Google Form platform created consists of Google Form Quiz 1, Google Form Quiz 2, Google Form Quiz 3, Google Form Quiz 4, Google Form UTS, and Google Form UAS. The steps to connect Google Forms with Google Sheets are as follows:

a. Open Google Forms

b. Click on the "Responses" icon at the top.

c. Here we will see the option to "create a new spreadsheet" or "select an existing spreadsheet."

d. To create a new spreadsheet, click on the "Create Spreadsheet" icon.

e. If you want to select an existing spreadsheet, click on the down arrow next to the Create Spreadsheet icon, then select "Select Existing Spreadsheet."

Google Sheet and Microsoft Excel Integration

The results of this online exam were stored in one Google Sheet file which consists of several sheets, namely Quiz 1 score sheet, Quiz 2 score sheet, Quiz 3 score sheet, Quiz 4 score sheet, UTS score sheet, UAS score sheet, and recap score sheet. The recap score sheet is a combination of quiz scores 1 to quiz 4, UTS scores and UAS scores. To combine all these results, formula (1)-(6) was used.

Quiz 1 =IFERROR (INDEX('QUIS 1'!$B$2:$C$26;MATCH(A2;'QUIS 1'!$C$2:$C$26;0);1);"")   (1)

Quiz 2 =IFERROR(INDEX('QUIS 2'!$B$2:$C$26;MATCH(A2;'QUIS 2'!$C$2:$C$26;0);1);"")   (2)

Quiz 3 =IFERROR(INDEX('QUIS 3'!$B$2:$C$26;MATCH(A2;'QUIS 3'!$C$2:$C$26;0);1);"")   (3)

Quiz 4 =IFERROR(INDEX('QUIS 4'!$B$2:$C$26;MATCH(A2;'QUIS 4'!$C$2:$C$26;0);1);"")   (4)

UTS =IFERROR(INDEX(UTS!$B$2:$C$26;MATCH(A2;UTS!$C$2:$C$26;0);1);"")
(5)

UAS =IFERROR(INDEX(UAS!$B$2:$C$26;MATCH(A2;UAS!$C$2:$C$26;0);1);"")
(6)

Here, $B$2:$C$26 was the cell range from cell B2 to cell C26, the $ sign indicates that the range is an absolute range, this range is found in all score sheets in Google Sheets which contain test scores and student names. IFERROR, INDEX, and MATCH are functions in Google Sheets, cell A2 contains the student's name as a reference in the recap sheets.

To enable offline viewing of exam results stored in Google Sheets, synchronization with Microsoft Excel was required. The steps to connect Google Sheets with Excel offline, so that it can synchronize data automatically, were as follows:

a. "Publish Google Sheets" to the web and copy the link.

b. In Excel, go to the Data tab and select "From Web", then paste the link and select the desired table.

c. "Set query properties" to refresh every five minutes and when opening a file.

d. Save the Excel file and check for updates from Google Sheets.

Output System Prototype

The final results of learning in this integrated system prototype were in the form of learning evaluation results which will automatically take the form of data in Microsoft Excel. Some adjustments were needed in Microsoft Excel so that the incoming data could be processed directly. In this prototype, to get the average quiz values, use the formula in formula (7), (where D3, E3, F3 and G3 are cells containing quis 1 to quis 4 values contained in the complete score sheet) while to get the total number value you can use the formula (8) (D3, E3, and F3 are cells that contain assignment grades, UTS grades, and UAS grades contained in the grade sheet to be printed). The value of this assignment is the same as the average value of the quiz.

$$= (D3 + E3 + F3 + G3)/4 \qquad (7)$$

$$= D3*0,2 + E3*0,4 + F3*0,4 \qquad (8)$$

Next, we converted the number values into letters using a nested IF statement, to checks the range of values. This conversion process could be done using formula (9). In this formula, G3 is the cell that contains the number value. This formula will check; 1) If the value is more than or equal to 90, it will return "A", 2) If not, it will check if it is more than or equal to 80, if yes then "AB", and so on up to "E".

$$=IF(G3>=90; \text{"A"}; IF(G3>=80; \text{"AB"}; IF(G3>=70; \text{"B"}; IF(G3>=60; \text{"BC"}; IF(G3>=50; \text{"C"}; IF(G3>=40; \text{"D"}; \text{"E"}))))))$$

(9)

After creating a prototype integration system between Google Sheet and Microsoft Excel, a trial was carried out using the system with questions that had been previously prepared in the Numerical Methods course. The learning output results are presented as in Figure 2.

DAFTAR NILAI MATA KULIAH METODE NUMERIK SEMESTER GENAP TAHUN AKADEMIK 2022/2023							
NO	NAMA	NPM	TUGAS 20%	UTS 40%	UAS 40%	NILAI ANGKA	HURUF
1	Mahasiswa 1	12345001	90	90	90	90	A
2	Mahasiswa 2	12345002	90	95	90	92	A
3	Mahasiswa 3	12345003	80	90	90	88	AB
4	Mahasiswa 4	12345004	90	75	80	80	AB
5	Mahasiswa 5	12345005	90	90	90	90	A
6	Mahasiswa 6	12345006	90	80	90	86	AB
7	Mahasiswa 7	12345007	90	90	90	90	A
8	Mahasiswa 8	12345008	90	95	90	92	A
9	Mahasiswa 9	12345009	90	80	90	86	AB
10	Mahasiswa 10	12345010	90	90	90	90	A

Fig. 2. Output result of system prototype

The prototype system that has been tried to be developed has proven to be an alternative for educators to use in the student learning evaluation process. The development of this integrated system is expected to improve digital literacy and analytical skills that are important for students' future employment, speed up administrative processes such as assessment and reporting, free up more time for teaching, enable a more measurable and data-based approach to learning and assessment, facilitate work between students and teachers through sharing and collaborative tools, and preparing students and teachers to adapt to evolving technology trends. The use of this technology not only supports the current learning process but also prepares the educational community, especially educators and students, for future challenges and opportunities. In the future, further research needs to be carried out on this system, such as the effectiveness of its use and its application in the direct learning evaluation process.

CONCLUSION

Google Sheets and Microsoft Excel are two platforms often used in education to manage and analyze learning data, one of which is in the learning evaluation process. The Google Sheet and Microsoft Excel integration system prototype that has been tried to be developed has proven to be an alternative for educators to use in the student learning evaluation process. It is important for educators to develop the necessary digital literacy and utilize

available training to maximize the use of these tools. With the right approach, the use of Google Sheets and Microsoft Excel can bring long-term benefits in learning evaluation, including increased efficiency, accuracy, and students' analytical skills. Further research needs to be carried out on this system, such as the effectiveness of its use and its application in the direct learning evaluation process.

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